

# **Cardio-ankle vascular index and carotid-femoral pulse wave velocity are closely associated with chronological age**

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## **Background:**

Vascular stiffening is part of the ageing process. However, it is not clear which vascular stiffness parameters are closely associated with chronological age.

## **Methods:**

Fifty-eight participants (38 men), age  $69.57 \pm 10.46$  (mean  $\pm$  SD, range = 47-90 years) who have had transient ischaemic attack or lacunar stroke within the last 2 weeks, had vascular stiffness parameters, brachial and central blood pressures measured. Cardio-ankle vascular index (CAVI) was measured with VaSera VS-1500N® (Fukuda Denshi, Japan); carotid-femoral pulse wave velocity (cfPWV) and carotid-radial pulse wave velocity (crPWV) were measured with Complior® (ALAM Medical, France); radial augmentation index (rAIx) and central blood pressure were measured with SphygmoCor® (AtCor, Australia).

## **Results:**

The mean and standard error of the mean for each parameter (mean  $\pm$  SEM) was as follows: CAVI= $9.77 \pm 0.21$ , cfPWV =  $10.61 \pm 0.46$  m/s, crPWV =  $11.05 \pm 0.30$  m/s, rAIx =  $31.34 \pm 1.60$  %, and central pulse pressure (cPP) =  $50.22 \pm 1.81$  mmHg. In a bivariate analysis, CAVI ( $r = 0.59$ ,  $p < 0.01$ ) and cfPWV ( $r = 0.39$ ,  $p < 0.01$ ) were significantly associated with age, but rAIx ( $r = 0.12$ ,  $p = 0.371$ ) and crPWV ( $r = 0.06$ ,  $p = 0.682$ ) were not. A multivariate regression analysis, performed with age as the dependent factor and CAVI, cfPWV, crPWV, cPP, and rAIx as independent parameters, showed that CAVI was the only significant parameter ( $\beta = 0.49$ ,  $p = 0.002$ ) associated with age.

## **Conclusion:**

CAVI and cfPWV are closely associated with chronological age, whereas crPWV and rAIx are less so. We suggest that the vascular parameter which best predicts biological age is CAVI, followed closely by cfPWV.

**Keywords:**

ageing, vascular stiffness; cardio-ankle vascular index; pulse wave velocity; radial augmentation index; transient ischaemic attack; lacunar infarct.